TRANSPORTATION DISTRICT 2

Dedicated people creating transportation solutions through innovation and exceptional service.

TECHNICAL BULLETIN

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Conversion Factor Tons to Cubic Yards

Inside this issue:

Special points of interest:

- This is a reminder for construction field staff.
- Please arrange to take pictures of your project for possible award submittal at a later date.

Is there a nice simple conversion factor for Tons of Granular Backfill to Cubic Yards??

Staff in the field frequently asks this question. The answer is not as simple as one may think.

For design purposes, a simple conversion for estimating quantities on the plans is two (2) tons per cubic yard. (Refer to FDM Procedure 14-15-10 Table 1 for some common conversions for aggregates). ***This should be used for estimate purposes only!!***

For construction purposes, the engineer must document pay quantities in the field. Section 209 of the Standard Specifications indicates that the Backfill Granular will be measured by the cubic yard "either in its original position or in its final position. For minor quantities, the engineer may measure by the cubic yard in the vehicle". This would indicate that this item **normally** should be paid for by volume (C.Y.) and **not** by weight (Tons).

When it is necessary in those rare cases to convert the pay item of Backfill Granular from Cubic Yards to Tons, the method that should be used is as follows. Obtain a weight of the material in a truck and then measure the volume of that same material inside the truck box. The weight per cubic yard can then be calculated. Since this material in the truck is in a "loose" or uncompacted condition, a shrinkage factor must be applied to the quantity to reduce the volume of this material to what is considered an "in place" measurement.

In order to determine the shrinkage factor to be used, the unit weight per cubic yard of the material in place must be obtained. This can be accomplished through use of nuclear density on the material after it has been placed and compacted. The shrinkage factor would then be determined through a direct correlation between the unit weight in the truck box and the unit weight of the compacted material after placing. A typical shrinkage factor may be in the range of 1.10 to 1.20 for Backfill Granular.

The engineer is responsible to document how the shrinkage factor is determined and also how the conversion from cubic yards to tons is accomplished. This must be included in your Finals records.

A contract modification must be written to incorporate the new item paying for the material by Tons. This should be a no cost contract Modification based on the original plan quantity.

Plan Development and PS&Es for Tied Projects

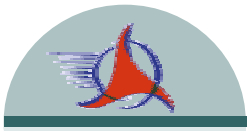
As a designer develops final plans for PS&E for tied projects (two or more project lumped into one contract), he or she should review their options as to the format to use. Below is a detail look into each of the PS&E documents required in a submittal and how to develop them.

Plans

Depending on the location in each project, the designer has options as to how to develop the plans. The designer could develop each project plan separately or combine them into one plan set.

- **One plan set**: Typically when the project IDs are for separate sections of the same highway, the plans can be combined into one. This maintains the continuity of the project in a similar manner as how the construction would actually progress. One title sheet would be used showing both projects. If the information on an individual plan sheets pertained to only one of the projects, then only that project ID would show up in the ID Block for that particular sheet. If information pertained to both of the projects then both IDs would be shown in the ID block. This is the same for the other information shown in the border of the plan sheets. Also, if a Typical Section or Construction Detail applies to one project, the Project ID should accompany that particular section or detail.

- **Two plan sets:** Developing tied projects with two plan sets work best for situations where the projects are located in different areas like multiple Park and Ride Lots. Here the information from one project doesn't necessarily relate to another project so keeping them separate can minimize confusion as to which details apply to which project. This method will work for the adjacent projects on the same roadway as explained in the one plan set paragraph above, but having separate plans here can cause duplicate work for some of the sections of the plan (title sheet, general notes, typical sections, construction details, etc.).



Designers could develop each plan separately or combine them into one plan set.

Special Provisions

Contracts con only have one set of Special Provisions. Articles that pertain to only one project should be identified as such. In some articles such as 'Traffic', general requirements pertaining to both projects should be discussed first followed by information for each individual project.

Plan Letter

Only one plan letter should accompany the PS&E documents. Use the Project ID number to designate information pertaining to only one project and not the others in the contract.

R/W Certification

Only submit one Certificate of Right of Way identifying parcels and their status for all the projects in the contract.

Utility Status Report

Only submit one Utility Status Report identifying all utilities and parcels for all projects.

Project Status Report

Only submit one Project Status Report identifying all projects.

Highway Work Proposal

Only submit one Highway Work Proposal identifying all projects.

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New format for Intersection Crash Data Report

The annual D-2 report on intersection crash data has gone to electronic format. The latest report, 2002, will not be printed and distributed in the familiar hard copy spiral bound book. The report includes intersections on district state trunk and connecting highways.

Data formerly found in the hard copy report is now available as a Microsoft Access database at **W:/ planning/access/shortcut to crsh812mdb** on the D-2 LAN. Consultants may request information through their DOT project managers. Various reports, similar to the former hard copy reports, are available thru the report menu button. The database also has a search feature to locate crash data for individual intersections.

The database is maintained by the D-2 planning analysis section. Contact Mike Bub, (262)521-5458, for further information or questions about the database.

Plan Development and PS&Es for Tied Projects continued from Page 2

Time Chart
Depending if the projects are adjacent to each other or separate and unrelated will determine how many Time Charts will be needed to show how the contract time was estimated for the contract.

Governor's Bond
Only one Governor's Bond is required per contract. It should identify all projects but not identify the funding break down on the bottom.

Engineer's Estimate
An Engineer's Estimate is required for each project ID in the contract. Designers need to pay special attention to not duplicating a bid item number from one project to another if the items of work are different. A SPV.0005 item in project A and a SPV.0005 item in project B should not both be labeled as SPV.0005.01 if the work is different.

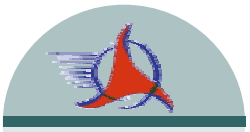
D2 News Release (District 2)
Only one D2 News Release should be submitted with the PS&E.

D2 State Furnished Sign Order (District 2)
Only one D2 State Furnished Sign Order should be issued per contract. Designers should identify which signs are required for each project.

Detour Proposal (District 2)
One detour proposal should be submitted for each detour on the project. The form should identify which project IDs the detour relates to.

PS&E Planning Worksheet (District 2)
Only one PS&E Planning Worksheet should be submitted with the PS&E.

"D" Size Plan and Proposal Distribution Form (District 2)
Only one "D" Size Plan and Proposal form should be submitted with the PS&E.



Intersection Crash Data Report is now available as a Microsoft Access Database

Late tips for asphalt paving

As asphalt paving operations begin in earnest to beat the snowflakes, there are a couple of things that can be done at the paving operation itself to discourage slippage between courses.

Tack coat must be distributed uniformly over the surface. The distribution bar should spray the tack so that the entire surface is covered as the truck passes. The dribbling of tack streams from each nozzle is not enough to provide even coverage. Each nozzle should produce a ***spray*** pattern that spans a distance equal to the spacing of the nozzles on the bar. Standard Specifications describe distribution bars and pumps required to "Distribute {tack coat} uniformly over the surface to be treated".

Tack is an oil/water emulsion. If too much of the water is left when the top layer of pavement is placed, the water may act as a lubricant between courses. Tack works better when the emulsion has had time to break down and all of the water evaporates. The oil portion then becomes even tackier. Keeping the tack truck well ahead of the paver allows time for the emulsion to break down before being covered by the next course. Chapter 7.6.6.2.1 of the Construction and Materials Manual states that "Care must be taken that the water from the emulsion has evaporated prior to paving over the tack coat".

Notification for coordinating utility work

Effective August 28, 2003 please send a copy of all State project notifications, regardless of size or purpose, along with all project Operational Planning Meeting Notices to:

Mr. Carl Lemmer, Project Manager
Regulatory & Utility Accommodation
We Energies
333 W. Everett St. A279
Milwaukee, WI 533203
or E-Mail: carl.lemmer@we-energies.com

Customer service staff, engineering and construction are located in area offices. By sending all information to one central location, they will be better able to coordinate and tract your projects.

If you have questions about the status of an individual project, please contact Mr. Tim Eckblad, Sr., analyst at (414) 221-2716.

And as a reminder, please be sure to send information on all new projects to:

Mr. Andy Eberhardt
American Transmission Company
N19 W23993 Ridgeview Pkwy W
PO Box 47
Waukesha, WI 53187-0047

Early notification allows the utilities to evaluate, plan and schedule related utility work. In some cases, minor changes to plans can avoid major relocations of gas and electric facilities, resulting in saving time and money for all concerned. If you have any questions please contact Carl Lemmer of We Energies at (262) 544-7248.

Transportation District 2

WISDOT District 2
141 NW Barstow St.
PO Box 798
Waukesha WI 53187-0798
Phone 262 548 6729
Fax 262-548-6465
E-Mail: dtd2techbulletin@dot.state.wi.us
Visit our Web Site
http://dtd-d2
Click on the Technical Bulletin Link

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